

LISTING OF CLAIMS

The listing of claims provided below replaces all prior versions, and listings, of claims in the application.

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1. (Currently Amended) An apparatus for use in a chemical mechanical planarization (CMP) system, comprising;

a polishing pad that is linear;

a slurry delivery device positioned upstream to deliver a slurry onto the polishing

10 pad;

a fluid restraining device positioned upstream from the slurry delivery, the fluid restraining device being positioned in close proximity to the polishing pad so as to define a level distribution of the slurry across a width of the polishing pad;

15 a head ~~capable of~~ being positioned at a proximate location that is spaced apart and over a polishing pad between ~~[[a]]~~ the fluid delivery device and a wafer carrier, the head including,

an input defined in the head, the input being for delivery ~~capable of delivering~~ a fluid at the proximate location and onto the surface of a polishing pad; and

20 an output in the head, the output being oriented adjacent to the input and separated by a gap, the output capable of removing at least part of the ~~fluid~~ slurry delivered onto the surface of the polishing pad, wherein a plurality of the heads may be configured to span an application area over a width of the polishing pad that is linear.

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2. (Original) The apparatus of claim 1, wherein the head is moveable.

3. (Original) The apparatus of claim 1, wherein the head may contain a plurality of additional inputs and outputs.

5 4. (Cancel)

5. (Original) The apparatus of claim 1, wherein the proximate location of the head over the polishing pad is between about 0.1 mm and about 1 mm.

10 6. (Original) The apparatus of claim 1, wherein the input is formed in the head by one of milling, drilling, boring, and casting.

7. (Original) The apparatus of claim 6, wherein the input formed in the head may include at least one conduit.

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8. (Original) The apparatus of claim 1, wherein the fluid may be one of an abrasive-free chemically inert liquid, deionized water and a process indifferent fluid.

9. (Original) The apparatus of claim 1, wherein the output is capable of removing
20 materials present on the polishing pad.

10. (Original) The apparatus of claim 10, wherein the materials on the polishing pad capable of being removed by the output may be one or a combination of slurry, deionized water, isopropyl alcohol, particulates, abrasives, material residues, and pad
25 residues.

11. (Original) The apparatus of claim 10, wherein removal of slurry adjusts a degree of planarization by the CMP system.

12. (Original) The apparatus of the claim 1, further comprising a computer.

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13. (Original) The apparatus of the claim 12, wherein the computer is capable of communication with a sensor located on the CMP system.

14. (Original) The apparatus of the claim 13, wherein the sensor is capable of
10 detecting material properties of a substrate including film thickness, conductivity, surface roughness, and topography height variations.

15. (Original) The apparatus of the claim 12, wherein the computer is capable of providing control over operation of the head.

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16. - 34. (Cancel)

35. (Currently Amended) An apparatus for use in a chemical mechanical planarization (CMP) system, comprising;

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a polishing pad;

a slurry delivery device positioned to deliver a slurry onto the polishing pad;

a fluid restraining device positioned adjacent to the slurry delivery device and positioned in close proximity to the polishing pad so as to define a level distribution of the slurry across the polishing pad;

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a plurality of heads ~~capable of being~~ positioned at a proximate non-contact location over ~~[[a]] the~~ polishing pad between ~~[[a]] the~~ fluid ~~delivery~~ restraining device and a wafer carrier, each head including,

5 an output defined in the head and ~~capable of being~~ positioned at the proximate location over the polishing pad, the output being configured to enable removal of a material present on the surface of the polishing pad; and

 an input defined in the head and ~~capable of being~~ positioned at the proximate location over the polishing head, the input for ~~capable of~~ delivering a
10 fluid to the surface of the polishing pad to at least partially replace the material that is configured to be removed by the output, the output being positioned on the head adjacent to the input.

36. (Previously presented) The apparatus of claim 35, wherein each head is
15 moveable.

37. (Original) The apparatus of claim 34, wherein the proximate location of the head over the polishing pad is between about 0.1 mm and about 1 mm.

20 38. (Currently amended) The apparatus of claim 35, wherein the material present on the surface of the polishing pad is ~~may be~~ one or a combination of slurry, de-ionized water, isopropyl alcohol, particulates, abrasives, material residues, and pad residues.

39. (Original) The apparatus of claim 35, wherein the fluid may be one of an
25 abrasive-free chemically inert liquid, deionized water and a process indifferent fluid.

40. (Original) The apparatus of the claim 35, further comprising a computer capable of communication with a sensor located on the CMP system.

41. (Original) The apparatus of the claim 40, wherein the sensor is capable of
5 detecting material properties of a substrate including film thickness, conductivity, surface roughness, and topography height variations.

42. (Previously presented) The apparatus of the claim 40, wherein the computer is capable of providing control over operation of each head.

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